

REMARKS

Claims 1 to 12 and 18 to 24 were amended and claims 13 to 17 were canceled by a preliminary amendment filed on June 11, 2007.

I. Allowable Subject Matter

According to paragraph 5 on page 5 of the Office Action mailed on October 5, 2010 dependent claims 2 and 20 were only objected to but would be allowable if rewritten in independent form including all the limitations of independent claims 1 and 19 respectively. Paragraph 6 on page 5 of the Office Action presents the reasons that claim 2 and claim 20 both cover an allowable data carrier.

II. Anticipation Rejection

Claims 1, 3 to 12, 18, 19, and 21 to 24 were rejected as anticipated under 35 U.S.C. § 102 (b) by U.S. Patent 6,005,691, issued to A.C. Grot, et al ("Grot").

Reconsideration of this anticipation rejection under 35 U.S.C. § 102 (b) is respectfully requested for the following reasons,

because of the differences between the disclosures of Grot and the applicants' invention as claimed in independent claims 1 and 19.

A. The Applicants' Claimed Invention

Applicants' claim 1 claims a data carrier comprising a core **layer** and an adjacent **layer** laminated to the core **layer**. The term "layer" is patentably distinguishable from the term "surface", because a surface is a two-dimensional entity and a layer is three-dimensional entity.

Furthermore claim 1 limits the core layer to a **volume** hologram, which is a holographic data memory. A volume hologram is to be distinguished from surface or surface relief holograms (articles "Holography", "Security Hologram" and "Volume Hologram" in Wikipedia, the free internet encyclopedia; also Curtis). The term "volume hologram" is also defined in the fourth paragraph on page 1 of the applicants' originally filed specification. A volume hologram is a **volume** that is filled with a light-sensitive material that has regions of different refractive index throughout the volume, i.e. planes of Bragg. A three-dimensional image may be reconstructed from the volume hologram by irradiating the volume hologram with white light.

According to applicants' claim 1 the adjacent **layer** applied to the core layer has a roughened adjacent **surface**, which is adjacent to the core layer, which is configured to cause a shift in the wavelength of the three-dimensional image that is reconstructed from the volume hologram. The shift in wavelength can only take place after the adjacent layer with the roughed or structured surface is laminated onto the core layer (page 2, lines 29 to 33, of applicants' originally filed specification).

The adjacent layer with the roughened surface provides a greater protection against forgery, which is explained on page 3, lines 4 to 20, of applicants' specification, because, *inter alia*, the adjacent layer prevents access to the core layer and because the shift in wavelength is hard to imitate.

The ability to shift the holographic image from the visible range to a range that is not detectable by the naked eye and *vice versa* is an attractive feature that facilitates forgery protection, which is disclosed in the last paragraph on page 10 of the applicants' specification.

Independent claim 19 claims a method of manufacturing the

data carrier according to independent claim 1. The claimed method comprises providing the core layer, providing the adjacent layer, producing a roughness on the adjacent layer, and laminating the adjacent layer with the roughened adjacent surface onto the core layer.

**B. Differences between Applicants' Claimed Invention
and the Disclosures of Grot**

The hologram described in Grot is not a volume hologram (see definition of volume hologram in the description on page 1, fourth paragraph, of the present application). Grot describes a surface hologram or surface relief hologram in which the holographic image is produced by the diffraction of light at the topological features 111 of the contoured surface 113 (see column 4, lines 23 to 31, of Grot). This is also clear from the description of the prior art that is improved in column 1 of Grot. The holographic memory in the prior art card shown in fig. 1B of Grot is a DOE, i.e. a diffraction grating 11 formed in the surface 13 of the hologram-containing card 1 (column 1, lines 10 to 40, especially lines 29 to 33).

This analysis is supported by the description of the disclosures of Grot in US 6,695,213 B2 (Curtis) in column 1, lines 49 to 65. Curtis uses the term "surface hologram" to describe the

hologram of Grot. Curtis explains that the advance of Grot was to provide a protective layer over the surface holograms of the prior art to make the surface hologram less accessible and thus more difficult to forge. However Curtis correctly points out that the surface holograms of Grot have the disadvantage that they contain much less information than a volume hologram. Thus it is clear that Grot discloses a surface hologram consisting of DOEs embedded in a surface or consisting of a structured surface of a layer or body, but not a volume hologram as claimed by the applicants' in their claim 1.

In contrast to the statements in the sixth line of paragraph 3 on page 2 of the Office Action, the reference sign 113 of Grot does not refer to a **layer** but instead to a **surface** of a substrate **layer** 109 in the card shown in fig. 3B of Grot. The "inner surface" of layer 109 is the contoured surface 113. The statements in paragraph 3 of the Office Action that lead to the result that "113" and the "inner surface" are two different elements is **not** correct, "113" designates the structured surface of the layer 109.

The contoured surface 113 with topological features 111 is not laminated to substrate 109 (like a layer which it is not), but is produced by embossing or injection molding the outer surface of the substrate layer 109, as explained in column 4, lines 32 to 47,

especially lines 40 to 47, of Grot.

The structured or roughened adjacent surface of the adjacent layer of applicants' data carrier claimed in claim 1 has an entirely different purpose from a holographic memory. The applicants' structured or roughened surface is configured to simply shift the wavelength of the image that is produced by the volume hologram, rather than record data itself.

The "contoured surface" 113 of Grot comprising the topological features 111 interacts with the incoming light and produces the holographic image comprising light at a whole wavelength spectrum. Most holograms used, for example in credit cards, are surface holograms, because those holograms are comparatively easy to produce. In contrast to that, in the present invention the roughness or structuring of the adjacent layer prior to lamination and the lamination step lead to a wavelength shift of the wavelength of the light at which the holographic image is produced from the volume hologram.

C. Independent Claims 1 and 19 are Not Anticipated by Grot

It is well established that each and every limitation of a

claimed invention must be disclosed in a single prior art reference in order to be able to reject the claimed invention under 35 U.S.C. 102 (b) based on the disclosures in the single prior art reference. See M.P.E.P. 2131. For example, the Federal Circuit Court of Appeals has said:

" 'For a prior art reference to anticipate in terms of 35 U.S.C. 102, every element of the claimed invention must be identically shown in a single reference' .. These elements must be arranged as in the claim under review, but this is not an 'ipsissimis verbis' test." *In re Bond*, 15 U.S.P.Q. 2nd 1566 (Fed Cir 1990).

Grot does not teach the following features of applicants' claim 1:

(1) Grot does not disclose a volume hologram or holographic data memory formed in a core layer; Grot only discloses a structured surface or surface hologram that is formed by a DOE or features 111 of a surface of a layer 109.

(2) Grot does not disclose an adjacent layer that has a roughness or structure prior to lamination with the core layer that is configured or structured to shift the wavelength of the image produced by the volume hologram.

In addition, one skilled in the art recognizes the difference between a surface hologram and a volume hologram, **as evidenced**

by the disclosures in column 1, lines 49 to 65, of US 6,695,213 B2 (Curtis), which are described above. However for a valid anticipation rejection a person of ordinary skill in the art must recognize that there is no difference between the claimed invention and the reference disclosure, in this case Grot, according to ***Scripps Clinic & Research Foundation v. Genetch, Inc.***, 18 U.S. P.Q. 2nd 1001, 1010 (Fed. Cir. 1991). Thus applicants' claim 1 is clearly not anticipated by Grot.

Method claim 19 is not anticipated by Grot, because it claims a method of manufacturing the data carrier according to claim 1.

For the aforesaid reasons withdrawal of the rejection of claims 1, 3 to 12, 18, 19, and 21 to 24 as anticipated under 35 U.S.C. § 102 (b) by U.S. Patent 6,005,691, issued to A.C. Grot, et al, is respectfully requested.

III. Other Prior Art Mentioned in the Office Action

US '531 (Yagi) does not disclose a volume hologram. The holographic read-only memory of Yagi is a multi-layer stack of surface holograms, which can be ascertained from column 10, lines 13 to 18 (figs. 4A-C). Also this can be understood from column 1,

lines 30 to 57, of Yagi.

Also Yagi teaches that holograms can be divided into surface holograms and volume holograms and that one is not a species of the other in column 1, lines 28 to 32. In other words, volume holograms are clearly recognized in this field of art as being different in kind from surface relief holograms.

US 6,721,076 (King) discloses a method and system of recording successive holograms in a recording medium including a reflective substrate layer, a polarization shifting layer, and a photo recording medium layer. See the abstract of King, et al. Although the holograms are recorded in a multi-layer system, they are recorded in a single photopolymer layer 326 (column 3, lines 30 to 65).

US 6,695,213 B2 (Curtis) discloses a holographic card for storing data in a holographic format comprising a holographic layer and a transparent protective layer overlapping the holographic layer. However the protective layer does not shift the wavelength of the holographic image.

US 6,721,076 (King) and US 6,695,213 B2 (Curtis) do

disclose volume holograms, but they do not disclose a core layer consisting of a volume hologram that has a laminated adjacent layer with a pre-lamination structured surface that is **configured to shift the wavelength of the holographic image** derived from the volume hologram. They do not disclose the features of applicants' claims 1 and 19.

IV. Independent Claims 1 and 19 are Not Obvious from the Prior Art

The traditional TSM test for obviousness of a claimed invention under 35 U.S.C. § 103 was not abolished by the KSR Supreme Court decision according to M.P.E.P. § 2143. According to this test the modifications of the disclosure in a prior art reference or references used to reject the claimed invention, which are necessary to arrive at the claimed invention, must be obvious to one of ordinary skill in the art for a valid rejection under 35 U.S.C. § 103. For example, the Court of Appeals for the Federal Circuit has said:

"Rather, to establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant...Even when obviousness is based on as single reference there must be a showing of a suggestion of motivation to modify the

teachings of that reference..” *In re Kotzab*, 55 U.S.P.Q. 2nd 1313 (Fed. Cir. 2000). See also M.P.E.P. § 2141

Accordingly there must be some hint or suggestion in the art of the modifications of the disclosures of Grot that are necessary to replace the surface hologram of Grot with a core layer consisting of a volume hologram and to provide the core layer with an adjacent layer that has an adjacent surface that is configured or structured to shift the wavelength of the image produced by the volume hologram.

It is respectfully submitted that no such hint or suggestion is present in the other prior art references, such as Yagi, Curtis and King. Although Grot suggests a protective layer, the protective layer does not have a surface that is structured to shift the wavelength of an image produced by the hologram.


Furthermore a layer that performs this function as explained above, namely shifting the wavelength of the image produced by the hologram e.g. into or out of the visible range as explained in the last paragraph on page 10 of applicants’ specification is a technique that has been hitherto unknown in this field of art. Hence it is not a known technique that can provide the basis of one of the other rationale according to the KSR Supreme Court decision as explained in M.P.E.P. § 2143.

Accordingly it is respectfully submitted that claims 1, 3 to 12, 18, 19, and 21 to 24 should not be rejected as obvious under 35 U.S.C. § 103 (a) over U.S. Patent 6,005,691, issued to A.C. Grot, et al, in combination with any of the secondary references, King, Curtis and/or Yagi.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,


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